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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Lars LIDGREN et al.

TITLE: DEVICE FOR MINI-INVASIVE ULTRASOUND TREATMENT OF AN
OBJECT BY A HEAT-ISOLATED TRANSDUCER**AMENDED CLAIMS**

1. (currently amended) Device for mini-invasive ultrasound treatment of an object, wherein at least one therapeutic ultrasound transducer (2) is arranged for treatment of the object (5) by generating an ultrasonic field (3), the temperature focus (F) of which is located in the object (5) for heating thereof; wherein the therapeutic ultrasound transducer (2) comprises a probe (10) adapted to be introduced into the body towards the object (5) to be treated and comprises a front portion (10a) adapted to be located at, against or in the object (5); and wherein said probe (10) comprises at least one transmitter element (11) for generating said ultrasonic field (3), ~~characterized in that~~ wherein said transmitter element (11) is arranged in a rear portion (10b) behind the front portion (10a) of the probe (10), and in that said front portion (10a) is configured to be thermally insulating, whereby the transmitter element (11) does not heat or substantially not heat the front portion (10a) during operation.
2. (currently amended) Device according to claim 1, ~~characterized in that~~ wherein the front portion (10a) of the probe (10) comprises a focusing device (13) for focusing the ultrasonic field (3) generated by the transmitter element (11).
3. (currently amended) Device according to claim 2, ~~characterized in that~~ wherein the distance (A) between the transmitter element (11) and the focusing device (13) for focusing the ultrasonic field (3) in temperature focus (F) is in the range of 0.5-20 centimeters.
4. (currently amended) Device according to claim 3, ~~characterized in that~~ wherein the distance (A) between the transmitter element (11) and the focusing device (13) for focusing the ultrasonic field (3) in temperature focus (F) is in the range of 1-18 centimeters.

5. (currently amended) Device according to ~~any of the claims 2-4,~~
~~characterized in that~~ claim 2, wherein the probe (10), in a space (10e) between
the transmitter element (11) and the focusing device (13) for focusing the
ultrasonic field (3) in the temperature focus (F), is configured and/or comprises a
material such that only small power losses in the ultrasonic field (3) is obtained
therein.
6. (currently amended) Device according to ~~any of the claims 2-5,~~
~~characterized in that~~ claim 2, wherein the probe (10), in a space (10e) between
the transmitter element (11) and the focusing device (13) for focusing the
ultrasonic field (3) in the temperature focus (F), comprises a material adapted to
exert a focusing effect on the ultrasonic field (3) together with the focusing device
(13).
7. (currently amended) Device according to ~~any preceding claim,~~
~~characterized in that~~ claim 1, wherein an optical navigation device (20) comprises
at least one diagnostic camera (24) arranged to generate at least one image of
the anatomical structure (23) of the treatment area (22) within which the object
(5) to be treated is located.
8. (currently amended) Device according to claim 7, ~~characterized in that~~
wherein the diagnostic camera (24) is an X-ray camera (25).
9. (currently amended) Device according to claim 8, ~~characterized in that~~
wherein the X-ray camera (25) comprises a positioning device (26) with markers
(27) which are intended to determine the position of the anatomical structure (23)
displayed in a monitor (24) and present at the patient's (4) disc (5) to be treated.
10. (currently amended) Device according to claim 9, ~~characterized in that~~
wherein the monitor (24) is arranged to display two X-ray photographs of said
anatomical structure (23) taken with the X-ray camera (25) from two different
locations.
11. (currently amended) Device according to claim 7, ~~characterized in that~~
wherein the diagnostic camera (24) is a computerized tomography (CT) scanner
which is arranged to produce images of the anatomical structure (23) at the

patient's (4) object (5) to be treated, which images being processed in a computer program (software) for obtaining a 3D-image in a monitor-(24).

12. (currently amended) Device according to claim 7, ~~characterized in that~~ wherein the diagnostic camera (24) is an X-ray camera or a MRI scanner which is arranged to produce images of the anatomical structure (23) at the patient's (4) object (5) to be treated, which images being processed in a computer program (software) for obtaining a 3D-image in a monitor-(24).

13. (currently amended) Device according to ~~any of claims 7-12,~~ claim 7, wherein the optical navigating device (20) further comprises at least one signal receiving or signal sending unit (32) which is intended to receive signals from and/or send signals to position transmitters-(31, 7) on

a) a reference device (28) which has a set position relative to the object (5) and

b) the therapeutic ultrasound transducer (2) such that the position thereof relative to said treatment area (22) can be determined.

14. (currently amended) Device according to claim 13, ~~characterized in that~~ wherein the signal receiving or signal sending unit (32) is arranged to receive or send signals in the form of infrared light or visible light or radio frequency electromagnetic waves or acoustic waves and that said position transmitters (7, 34) are arranged to send or receive signals in the form of infrared light or visible light or radio frequency electromagnetic waves or acoustic waves.

15. (currently amended) Device according to claim 13 ~~or 14,~~ characterized in that wherein the reference device (28) is attached to a vertebra (29) in the patient's vertebral column, preferably to the spinal process (30) of said vertebra (29).

16. (currently amended) Device according to ~~any of claim 13-15,~~ claim 13, wherein the reference device (28) comprises position transmitters (34) consisting of metallic balls, preferably tantalum balls.

17. (currently amended) Device according to claim 16, ~~characterized in that~~ wherein the signal receiving or signal sending unit (32) of the optical navigating device (20) is at least one X-ray device.
18. (currently amended) Device according to ~~any of claim 7-17, characterized in that that~~ claim 7, wherein a tube (48) with an associated inner portion is insertable towards the object (5) to be treated and that said inner portion is intended to be replaced by the therapeutic ultrasound transducer (2).
19. (currently amended) Device according to claim 18, ~~characterized in that that~~ wherein said tube (48) is navigatable by means of the optical navigating device (20) through the skin of the patient (4) and brought into contact with the object (5) to be treated.
20. (currently amended) Device according to ~~any preceding claim, characterized in that~~ claim 1, wherein the temperature in the temperature focus (F) of the therapeutic ultrasound transducer (2) exceeds 45°C.
21. (currently amended) Device according to ~~any preceding claim, characterized in that~~ claim 1, wherein a calibrating device (37) is arranged for calibrating the power emitted by the therapeutic ultrasound transducer (2) in the temperature focus (F) of said therapeutic ultrasound transducer (2) and/or the position of said temperature focus (F) relative to the transmitter element (44) of the therapeutic ultrasound transducer (2).
22. (currently amended) Device according to claim 21, ~~characterized in that~~ wherein the calibrating device (37) is arranged to measure the emitted power by means of the echo of an ultrasound transmitter.
23. (currently amended) Device according to claim 22, ~~characterized in that~~ wherein the calibrating device (37) is arranged to measure the echo from the therapeutic ultrasound transducer (2).
24. (currently amended) Device according to ~~any preceding claim, characterized in that~~ claim 1, wherein the probe (40) is provided with a cooling device comprising channels conducting cooling liquid around the tip of the probe (40), which tip is provided with a membrane.

25. (currently amended) Device according to ~~any preceding claim,~~
~~characterized in that~~ claim 1, wherein the device is arranged for mini-invasive
ultrasound treatment of an object (5) in the form of nucleus pulposus (6) in the
patient's (4) disc.
26. (currently amended) Device according to claim 25, ~~characterized in that~~
~~wherein~~ the therapeutic ultrasound transducer (2) is arranged to be inserted
through the patient's (4) skin through a cut therein or by means of a cannula and
brought into contact with the disc which annulus fibrosus (8) is to be treated.
27. (currently amended) Device according to ~~any of the claims 1-24,~~
~~characterized in that it~~ claim 1, wherein the device is arranged for mini-invasive
ultrasound treatment of objects (5) in the form of ligaments in shoulders or knees.
28. (currently amended) Device according to ~~any of the preceding claims,~~
~~characterized in that electronics is~~ claim 1, wherein electronics are located in or
attached to the rear portion (10b) of the probe (10b) and arranged on the outside
of the patient during treatment.
29. (currently amended) Use of a device according to ~~any of the preceding~~
~~claims, characterized in that it~~ claim 1, wherein the device is used in methods for
treatment of an object (5) in a patient's (4) body, such as for treatment of nucleus
pulposus (6) in discs or ligaments in for example shoulders or knees.